DEQ
Piedmont Regional Office
Mercury Source Assessment
Dragon Swamp

2004/2005 Water and Sediment Sampling

2004/2005 Dragon Source Assessment Study Goals

- Define the spatial extent and magnitude of mercury contamination in water and sediment
- Determine if local ground sources are contributing to the problem

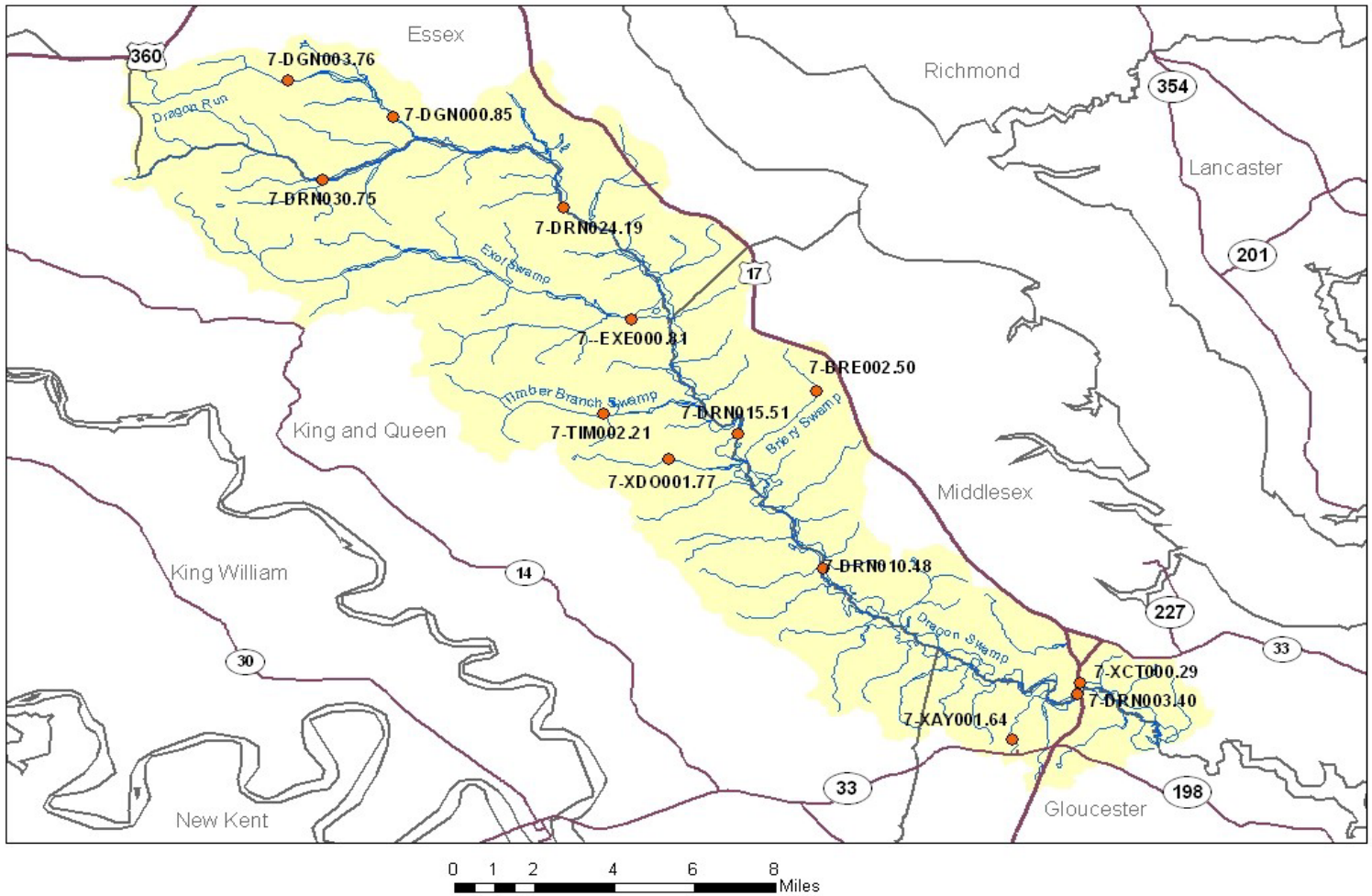
Is There a Local Source of Mercury?

- Working Hypothesis: If there is a local source, levels of total Hg will not be evenly distributed through out watershed
- Check all major tributaries to determine if any “hotspots” exist
- If atmospheric deposition is major source distribution of total Hg will be even throughout watershed.

Monitoring Sites
Water and Sediment

- 13 Locations in Watershed monitored quarterly for water and once for sediment
- 3 different monitoring runs rotated monthly
- Selected to provide even spatial coverage and address potential sources
- Site at USGS gauging station done monthly for use in loading models
- Cover areas of concern, racetrack, lumber treating facility, landfill, Community College

Dragon Swamp Mercury Source Identification Study
Monitoring Stations



Clean Metals Sampling of Total and Dissolved Mercury

Dissolved Hg was tested to Determine WQS compliance

Time required for filtration of samples limited number of stations that could be collected in a day

2004/05 Water Data Summary, ppt

7-BRE002.50 Briery Swamp Rt.604 below racetrack	Dissolved N=4 ADL=1 1.88* highest value	Total N=4 ADL=3 4.37 *
7-DGN 000.85 Dragon Run Rt 607	N=4 0=ADL	N=4 0=ADL
7-DGN003.76 Dragon Run Rt 612	N=4 0=ADL	N=4 2=ADL 1.7
7-DRN010.48 Gauging Station Mascott, Rt 603	N=12 0=ADL	N=12 2=ADL 2.52*
7-DRN015.51 Rt 602 Wares Bridge Rd.	N=4 1=ADL 1.68*	N=4 1=ADL 2.62*

2004/05 Water Data Summary, ppt

	Dissolved	Total
7-DRN024.19 Dragon Swamp Rt 604	N=4 0=ADL	N=4 1=ADL 1.6
7-DRN030.75 Rt 612	N=4 0=ADL	N=4 3=ADL 1.9
7-EXE000.81 Exol Swamp Rt 614	N=4 1=ADL 4.08*	N=4 2=ADL 7.09*
7-XCT000.29 Lumber treating Facility	N=4 1=ADL 1.89	N=4 2=ADL 3.79

2004/05 Water Data Summary, ppt

	Dissolved	Total
7-XAY001.64 Below Community College	N=4 1=ADL 1.9	N=4 3=ADL 4.8
7-XDO001.77 Private Rd. Below landfill	N=4 1=ADL 1.58	N=4 2=ADL 3.26
7-DRN003.40 Dragon Swamp Rt 17	N=4 1=ADL 1.85	N=4 2=ADL 2.21
7-TIM002.21 Timber Branch Swamp	N=4 1=ADL 6.14*	N=4 2=ADL 8.12*

Summary of Results

- All sediment values BDL of .1 ppm
- Highest dissolved Hg water value 6.14 ppt, In comparison, PWS human health standard is 50 ppt, Chronic aquatic life standard is 770 ppt
- Only 12% of dissolved Hg values ADL of 1.5 ppt
- No stations stand out as relatively higher than the rest of the watershed i.e. no obvious “hot spots”

Recommendations for 2005/2006

- Continue water monitoring for a second year
- Resample sediments at lower detection limit

- Sample only total mercury (unfiltered)
- Sample entire watershed on same day
- 3-4 dry weather and 3-4 rainfall influenced sampling events
- Statistical analysis to determine if differences between stations exist

- Begin similar study in the Mattaponi and Pamunkey Rivers???